

GP-302602

IMPROVED FLUX OBSERVER IN A SENSORLESS CONTROLLER  
FOR PERMANENT MAGNET MOTORS

ABSTRACT OF THE DISCLOSURE

A control system includes a field oriented controller that receives a torque command and that generates phase voltages for an electric machine. A first transformation module receives stator terminal  
5 currents and generates d-axis and q-axis stationary frame currents. An open loop flux observer receives d-axis and q-axis stationary frame voltage commands and the d and q-axis stationary frame currents. The open loop flux observer includes a vector cross product calculator that generates an error signal that is proportional to an angular  
10 difference between an estimated stator flux and a computed stator flux and a proportional integral controller that generates an estimated rotor angular position based on the error signal. A second transformation module receives the d-axis and q-axis stationary frame currents and the estimated rotor angular position and generates d-axis and q-axis  
15 synchronous reference frame feedback currents that are output to the field oriented controller.